

REMARKS

The specification has been amended to correct a minor typographical error. Claims 11-13, 15, 21, 23 and 25-27 have been amended to improve form and claims 30 and 31 have hereby been canceled without prejudice or disclaimer. Claims 11-15 and 21-29 are now pending in this application.

Initially, the applicants note that an Information Disclosure Statement (IDS) and Information Disclosure Citation (PTO-1449) along with three references were filed in this application on June 4, 2004. The PTO-1449 was not returned with the Office Action and the Patent Application Information Retrieval (PAIR) system does not show that this IDS and PTO-1449 were received. Apparently, this IDS and PTO-1449 were lost at the PTO.

Attached herewith as Attachment A are copies of the IDS transmittal letter, IDS and Information Disclosure Citation (PTO-1449) along with the three references that were originally filed on June 4, 2004. Also attached is a copy of the stamped postcard indicating receipt of these documents at the PTO on June 4, 2004. The applicants respectfully request that the Examiner consider the documents listed on the PTO-1449 and return a copy of this PTO-1449 with the next communication with the Examiner's initials indicating that these documents have been officially considered.

Claim 27 has been objected to as being a duplicate of claim 22. Claim 27 has hereby been amended to be dependent on claim 26 and therefore is no longer a duplicate of claim 22. Accordingly, withdrawal of the objection is respectfully requested.

Claims 11 and 21 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 9 of copending application Serial No. 10/770,011. The Office Action states that original claims 11 and 21 are not patentably

distinct over claim 9 of copending application 10/770,011. To expedite prosecution of this application, the applicants submit herewith a terminal disclaimer to overcome the rejection. Accordingly, withdrawal of the rejection of claims 11 and 21 under the doctrine of obviousness-type double patenting over claim 9 of application no. 10/770,011 is respectfully requested.

Claims 11, 13-15, 21, 23-26, 28 and 29 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Mathew et al. (U.S. Patent Application Publication No. 2003/0151077; hereinafter Mathew) or Yu (U.S. Patent No. 6,458,662). The rejections are respectfully traversed.

Claim 11, as amended, recites forming a fin structure on an insulating layer, the fin structure including a first side surface, a second side surface, and a top surface and having a thickness ranging from about 300 Å to about 1500 Å.

As to the rejection based on Mathew, the Office Action states that Mathew discloses forming a fin structure on an insulating layer and points to Fig. 2 for support (Office Action – page 3). Mathew may disclose forming a fin structure 24 on insulator 14. Mathew, however, does not disclose that fin structure 24 has a thickness ranging from about 300 Å to about 1500 Å, as recited in amended claim 11.

Claim 11, as amended, also recites depositing a gate material over the fin structure to a thickness ranging from about 300 Å to about 1500 Å, the gate material surrounding the top surface and the first and second side surfaces. The Office Action states that Mathew discloses depositing a gate material 28 over fin structure 24 and points to Fig. 3 for support (Office Action – page 3). Mathew may disclose depositing gate material 28 over fin structure 24. Mathew, however, does not disclose depositing a gate material to a thickness ranging from about 300 Å to about 1500 Å, as recited in amended claim 11.

For at least these reasons, Mathew does not disclose each of the features of amended claim 11.

In addition, the applicants assert that Mathew cannot be fairly construed to suggest the features discussed above. The applicants note that the Office Action with respect to claim 31, which recited a feature similar to one of the features discussed above, states that it would have been obvious to form the gate material with the claimed thickness range since “discovering the optimum or working ranges involves only routine skill in the art” and points to In re Aller to support this allegation (Office Action – page 5). The applicants respectfully disagree.

Mathew is totally silent with regard to the thickness of fin structure 24 and the thickness of the deposited gate material 28. Claim 11, in contrast, recites specific ranges for the thickness of the fin structure and the gate material. The mere fact that Mathew discloses forming a fin and depositing gate material over the fin cannot be fairly construed to suggest forming a fin structure having the claimed thickness and depositing gate material having the claimed thickness.

The applicants further assert that in making a rejection under 35 U.S.C. § 103, the Examiner must provide a factual basis to support the rejection. Reliance on *per se* rules, such as alleging that discovering the claimed ranges involves only routine skill in the art and is therefore not patentable, is improper. See In re Ochiai, 71 F.3d 1565, 1570, 37 USPQ2d 1127, 1132 (Fed. Cir. 1995). The claimed ranges enable the claimed method to achieve the desired result with respect to manufacturing a semiconductor device having the desired properties and the claimed ranges are not obvious based on the disclosure of Mathew.

For at least these reasons, claim 11 is believed to be allowable over Mathew and withdrawal of the rejection of claim 11 based on Mathew is respectfully requested.

Claims 13-15 depend upon claim 11 and are believed to be allowable over Mathew for at least the reasons claim 11 is allowable. In addition, these claims recite additional features not disclosed or suggested by Yu.

For example, claim 13, as amended, recites forming a dielectric layer over the top surface of the fin structure, the dielectric layer having a thickness ranging from about 150 Å to about 600 Å. Mathew discloses forming pad oxide layer 20 and/or nitride layer 22 over silicon structure 18 (Mathew – paragraph 17, lines 6-12). Mathew is totally silent with respect to the thickness of either of layers 20 and 22 and therefore cannot be fairly construed to disclose or suggest the range recited in amended claim 13.

For at least this additional reason, withdrawal of the rejection of claim 13 based on Mathew is respectfully requested.

Claim 21, as amended, recites features similar to claim 11. For reasons similar to those discussed above with respect to claim 11, Mathew does not disclose or suggest the features of amended claim 21. Accordingly, withdrawal of the rejections based on Mathew is respectfully requested.

Claims 23-25 depend upon claim 21 and are believed to be allowable over Mathew for at least the reasons claim 21 is allowable. In addition, these claims recite additional features not disclosed or suggested by Mathew.

For example, claim 23 recites features similar to claim 13. For reasons similar to those discussed above with respect to claim 13, withdrawal of the rejection of claim 23 based on Mathew is respectfully requested.

Claim 26, as amended, recites features similar to claim 11. For reasons similar to those discussed above with respect to claim 11, Mathew does not disclose or suggest the features of amended claim 26.

Claim 26, as amended, further recites forming gate dielectric layers having a thickness ranging from about 10 Å to about 50 Å on opposite sides of the fin. Mathew discloses forming gate dielectric 26 on opposite sides of silicon structure 18 (Mathew – paragraph 18, lines 2-5 and Fig. 3). Mathew, however, is totally silent with respect to the thickness of gate dielectric 26 and does not disclose that gate dielectric 26 has a thickness ranging from about 10 Å to about 50 Å, as recited in amended claim 26. The applicants further assert that Mathew cannot be fairly construed to suggest the claimed range since Mathew is totally silent with respect to the thickness of gate dielectric 26.

For at least these reasons, claim 26 is believed to be allowable over Mathew and withdrawal of the rejection of claim 26 based on Mathew is respectfully requested

Claims 28 and 29 depend upon claim 26 and are believed to be allowable over Mathew for at least the reasons claim 26 is allowable. Accordingly, withdrawal of the rejection of claims 28 and 29 based on Mathew is respectfully requested.

As to the rejection based on Yu, claim 11, as discussed above, recites depositing a gate material over the fin structure to a thickness ranging from about 300 Å to about 1500 Å, the gate material surrounding the top surface and the first and second side surfaces. The Office Action states that Yu discloses depositing a gate material layer 40 over fin structure and points to Fig. 4 for support (Office Action – page 4). Yu may disclose depositing a gate material layer 40 over fin structure 35. Yu, however, does not disclose that gate material layer 40 has a thickness ranging from about 300 Å to about 1500 Å, as recited in amended claim 11. In contrast, Yu discloses that

gate material layer 40 has a thickness of approximately 3000 Å to 6000 Å (Yu – col. 2, lines 33-35 and col. 3, lines 54-62).

For at least this reason, Yu does not disclose each of the features of amended claim 11.

In addition, the applicants assert that Yu cannot be fairly construed to suggest the feature discussed. For example, as discussed above, the Office Action with respect to claim 31 states that it would have been obvious to form the gate material with the claimed thickness range since “discovering the optimum or working ranges involves only routine skill in the art” (Office Action – page 5). The applicants respectfully disagree.

As discussed above, Yu discloses depositing a gate material layer 40 having a thickness ranging from approximately 3000 Å to 6000 Å. This range is significantly greater than the range recited in amended claim 11. In addition, as discussed above, the reliance on a *per se* rule that discovering the claimed range would involve only routine skill in the art does not satisfy the requirements of 35 U.S.C. § 103. As discussed above, the particularly recited range enables the claimed method to achieve the desired result with respect to manufacturing a semiconductor device having the desired properties and the claimed range would not be obvious based on the disclosure of Yu.

For at least these reasons, claim 11 is believed to be allowable over Yu and withdrawal of the rejection of claim 11 based on Yu is respectfully requested.

Claims 13-15 depend upon claim 11 and are believed to be allowable over Yu for at least the reasons claim 11 is allowable. In addition, these claims recite additional features not disclosed or suggested by Yu.

For example, claim 13, as amended, recites forming a dielectric layer over the top surface of the fin structure, the dielectric layer having a thickness ranging from about 150 Å to about 600 Å.

Yu discloses forming a thin gate dielectric layer 37 over fin structure 35 (Yu – col. 3, lines 54-56).

Yu, however, is also totally silent with respect to the thickness of dielectric layer 37 and does not disclose the range recited in amended claim 13.

For at least this additional reason, withdrawal of the rejection of claim 13 based on Yu is respectfully requested.

Claim 21, as amended, recites features similar to claim 11. For reasons similar to those discussed above with respect to claim 11, Yu does not disclose or suggest the features of amended claim 21. Accordingly, withdrawal of the rejection of claim 21 based on Yu is respectfully requested.

Claims 23-25 depend upon claim 21 and are believed to be allowable over Yu for at least the reasons claim 21 is allowable. In addition, these claims recite additional features not disclosed or suggested by Yu.

For example, claim 23 recites features similar to claim 13. For reasons similar to those discussed above with respect to claim 13, withdrawal of the rejection and allowance of claim 23 are respectfully requested.

Claim 26, as amended, recites features similar to claim 11. For reasons similar to those discussed above with respect to claim 11, Yu does not disclose or suggest the features of amended claim 26.

Claim 26, as amended, further recites forming gate dielectric layers having a thickness ranging from about 10 Å to about 50 Å on opposite sides of the fin. Yu discloses forming thin gate dielectric 37 over fin structure 35. Yu, however, is also totally silent with respect to the thickness of gate dielectric 37 and does not disclose that gate dielectric 37 has a thickness ranging from about 10 Å to about 50 Å, as recited in amended claim 26.

For at least these reasons, claim 26 is believed to be allowable over Yu and withdrawal of the rejection of claim 26 based on Yu is respectfully requested.

Claims 28 and 29 depend upon claim 26 and are believed to be allowable over Yu for at least the reasons claim 26 is allowable. Accordingly, withdrawal of the rejection and allowance of claims 28 and 29 are respectfully requested.

Claims 12, 22, 27, 30 and 31 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Mathew and Yu in view of Gambino et al. (U.S. Patent No. 6,689,650; hereinafter Gambino). The rejection is respectfully traversed.

Pending claims 12, 22 and 27 are dependent on claims 11 and 21 and are believed to be allowable for at least their respective independent claims are allowable. Gambino does not remedy the deficiencies in either Mathew or Yu with respect to claims 11 and 21 discussed above.

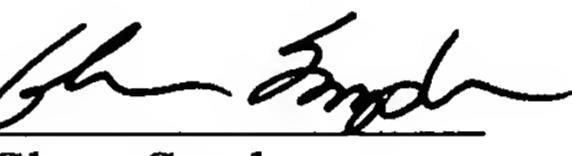
CONCLUSION

In view of the foregoing amendments and remarks, the applicants respectfully request withdrawal of the outstanding rejections and the timely allowance of this application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

HARRITY & SNYDER, L.L.P.

By: 
Glenn Snyder
Reg. No. 41,428

Attachment: Copy of PTO stamped postcard indicating receipt of PTO-1449
Copies of previously submitted IDS transmittal letter, IDS and 3 references

Date: September 29, 2004

11240 Waples Mill Road
Suite 300
Fairfax, VA 22030
Telephone: (571) 432-0800
Facsimile: (571) 432-0808